ACCIDENTAL DWELLING FIRES IN COVENTRY & SOLIHULL

Analysis of Fire and Casualty data to identify geographical areas and groups of the population most at risk of accidental dwelling fires in the Coventry & Solihull Command Area

April 2011 to March 2014

Data Intelligence Hub
2014

Introduction

The following document presents the results of the analysis of Accidental Dwelling Fires (ADF) in the Coventry & Solihull Command Area. Its aim is to assist in identifying geographical areas and groups of the population which are most at risk of ADF.

Three years of accidental dwelling fire and accidental dwelling fire casualty data were analysed: from April 2011 to March 2014.
There were a total of 947 accidental dwelling fires in Coventry & Solihull during that time period.

In each section of this document, a box summarises the main features highlighted in the section.

Unless otherwise stated, all non-fire related statistics about the Coventry & Solihull population such as age, ethnicity, property types, etc were taken from the Census 2011. Reference to each individual table used is made for the first mention of the table in the document. All tables are available online from the Office for National Statistics (ONS) website.

As the proportion of accidental dwelling fires in Coventry is much higher than in Solihull, the colour ranking on the maps was done separately for Coventry and for Solihull, as otherwise much of the latter's LSOAs (Lower Super Output Areas) would have remained in the lightest colour.

Recommendations

Suggested activities:

Consider placing a roaming appliance(s) or targeting prevention activities in the areas of Chelmsley Wood, Olton, and Lyndon in Solihull, and in the areas of Willenhall and Stoke, and Foleshill and the city centre in Coventry, between 12:00 and 14:00, and 17:00 and 20:00.

Consider winter prevention activities aimed at ensuring that electric installations and equipment are in working order.

Consider preventative partnership work with councils and housing associations, in particular with Solihull council and Coventry housing associations, with regards to smoking safety.

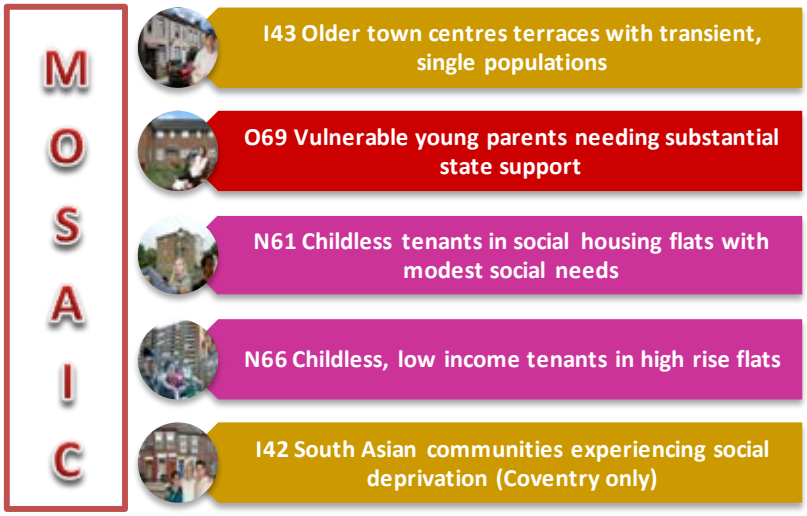
Consider prevention activities to promote the use of alarms systems in owner occupied properties.

Where, who and what to target for prevention:

- Coventry:
  - Willenhall and Stoke
  - Foleshill and City Centre
  - Tile Hill
- Solihull:
  - Chelmsley Wood
  - Olton
  - Lyndon

- 25-44 yr olds
- Elderly as casualties
- Women (although men tend to be more seriously injured)
- Single person households, particularly elderly
- Employment/health/income deprived households
- Alcohol/drugs
- Distraction, falling asleep

- Rented properties, especially socially rented
- Kitchen (cooking)
- Living room (smoking)
- Bedroom (smoking / matches, candles)



Temporal analysis

Table 1 illustrates the temporal distribution of accidental dwelling fires in Coventry & Solihull.

It shows that, over the course of a week, the highest number of ADF occurs between **12'00 and 14'00** and between **17'00 and 20'00**. **Tuesday** and **Sunday** had the greatest number of ADF, particularly in Coventry for the former and Solihull for the latter.

Table 1. Acc Dwell Fires in Coventry & Solihull per hour and day – Apr 2011 to Mar 2014

Day / Hour	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*
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Lowest

Highest

Chart 1 is the seasonality chart for accidental dwelling fires in Coventry & Solihull. If the column is a positive number (above the 0) then the number of incidents in that month is higher than expected, if the column is a negative number then the number of incidents in that month is lower than expected (the values on the vertical (y) axis are relative values).

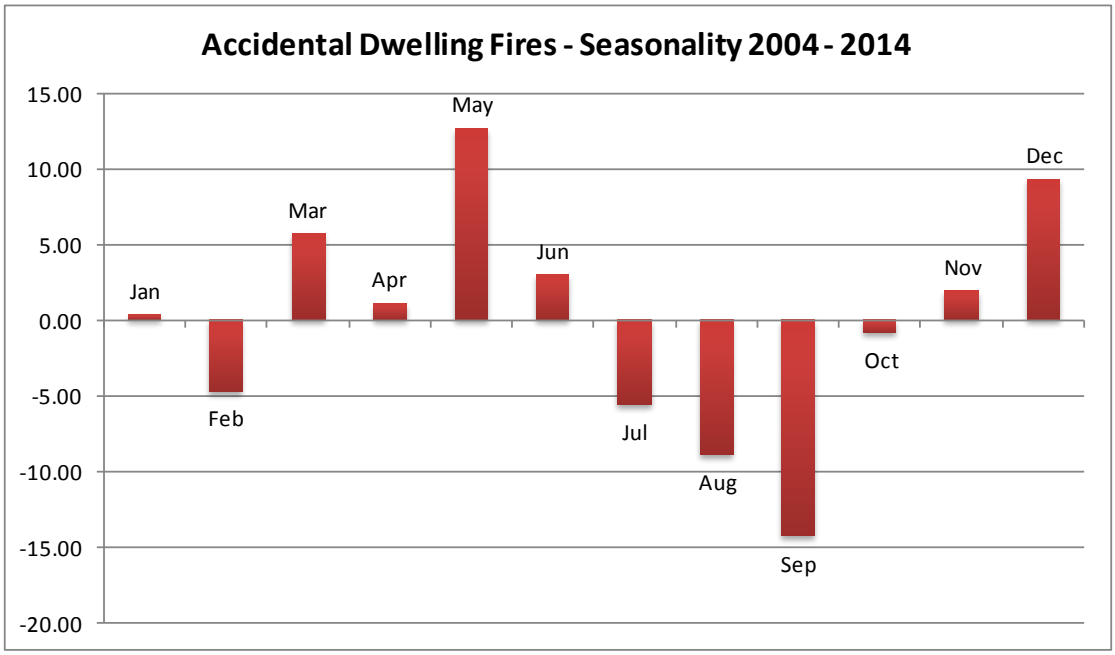
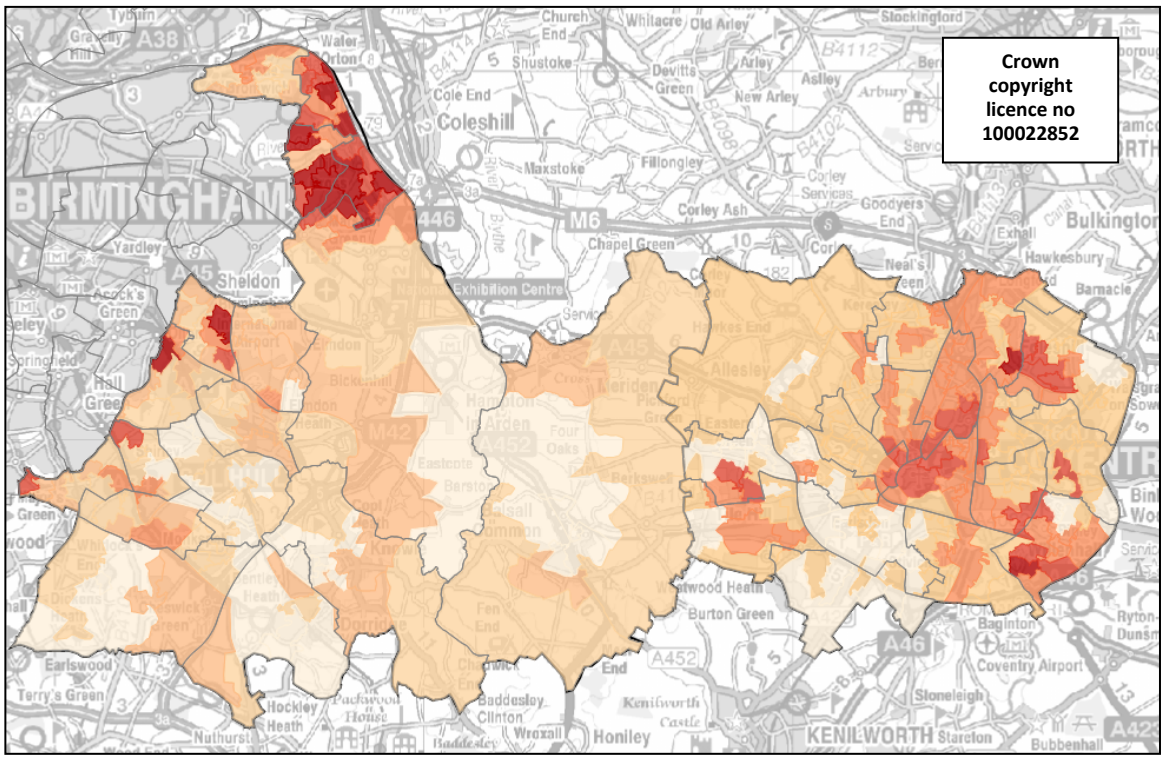


Chart 1. Seasonality - Accidental Dwelling Fires in Coventry & Solihull

It shows that, overall, accidental dwelling fires are most likely in March, May and December.

Location

In the map below, LSOAs are highlighted according to a calculated risk score based on the correlation between the number of accidental dwelling fires in each LSOA and various other datasets (please see Appendix A for a list of datasets used): the darker the LSOA, the greater the score and therefore the risk of accidental dwelling fires.



Map 1. Acc Dwell Fire calculated risk score in Coventry & Solihull

The map shows that the area of Chelmsley Wood, Olton, and Lyndon in Solihull, and in Coventry the areas of Willenhall and Stoke, Foleshill and the city centre, and to a lesser extent Tile Hill, presented the highest risk.

Correlation analysis suggests that, of the variables analysed, the number of accidental dwelling fires has the strongest correlation with the number of **socially rented households** in the LSOA[1].

It should be noted that correlation is only an indicator that two variables fluctuate together; it however does not necessarily imply causation.

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[1] Please see Appendix A for a list of variables and their correlation to accidental dwelling fire numbers

Source of ignition

The top three sources of ignition for accidental dwelling fires in Coventry & Solihull are **cooking appliances** (50.9% of accidental dwelling fires, 482 incidents), **electricity supply** (12.4%, 117 incidents), and **other domestic style appliances** (11%, 104 incidents).
However, when separating both boroughs, the third highest number of accidental dwelling fires in Solihull is that of smoking related fires (including cigarette lighters).
Smoking related fires were also more likely to result in casualties than ADF caused by electricity supply.

Cooking appliances fires:
Cooking fires accounted for over half of accidental dwelling fires, and resulted in over half of all accidental dwelling casualties (68.2%, one fatality and 113 injuries).

Chart 2 is the seasonality chart for cooking accidental dwelling fires in Coventry & Solihull. If the column is a positive number (above the 0) then the number of incidents in that month is higher than expected, if the column is a negative number then the number of incidents in that month is lower than expected. Please note the values on the vertical (y) axis are relative values.

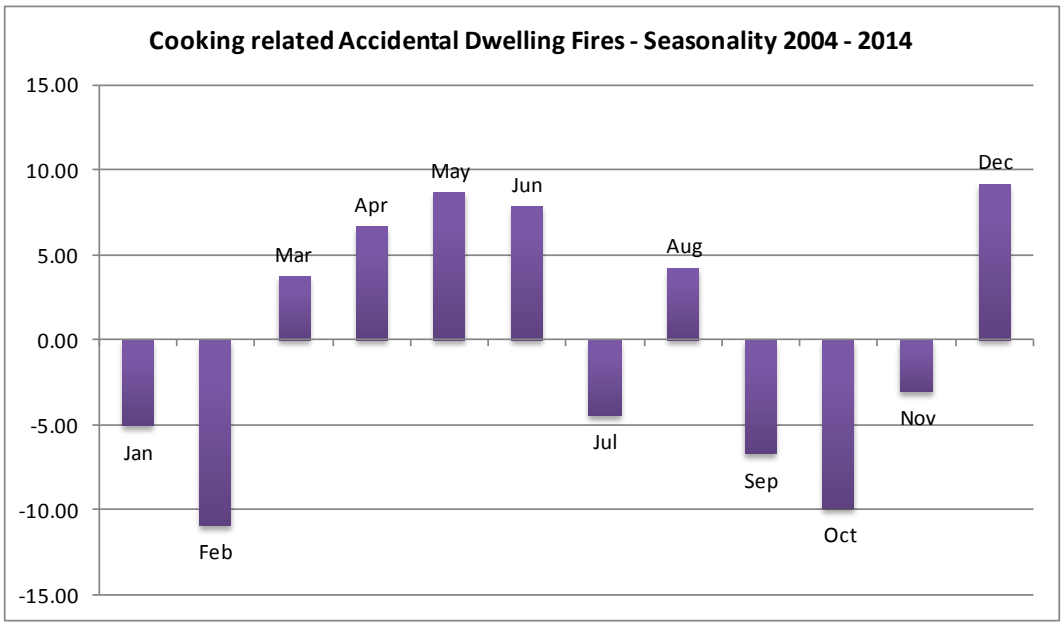

Chart 2. Seasonality - Cooking related Acc Dwell Fires in Coventry & Solihull

This shows that accidental dwelling fires are most likely to occur from **March to June**, and in **December**.

Table 2 shows that the temporal distribution of cooking fires is less spread out than accidental dwelling fires in general:

Table 2. Cooking Acc Dwell Fires in Coventry & Solihull per hour and day – Apr 2011 to Mar 2014

Day / Hour	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*
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Over a third of incidents took place between 16:00 and 20:00. Tuesday and Sunday had the greatest number of incidents: 9.3% took place between 12:00 and 19:00 on Sunday.

12.9% of cooking fires were alcohol- or drug-related, which is higher than the average of 9.2% for all accidental dwelling fires in Coventry & Solihull. Although there were more alcohol- or drug-related cooking fires in Coventry (41 compared to 21 in Solihull), the proportion was greater in Solihull (15.3%) than in Coventry (11.9%).

While cooking fires casualties are more likely to be aged 25 to 44 (26.3% of cooking fires), when comparing the casualties' age to the age of the owner occupier or person present during the fire, those aged 80 or over are more vulnerable to becoming a casualty of cooking fires:

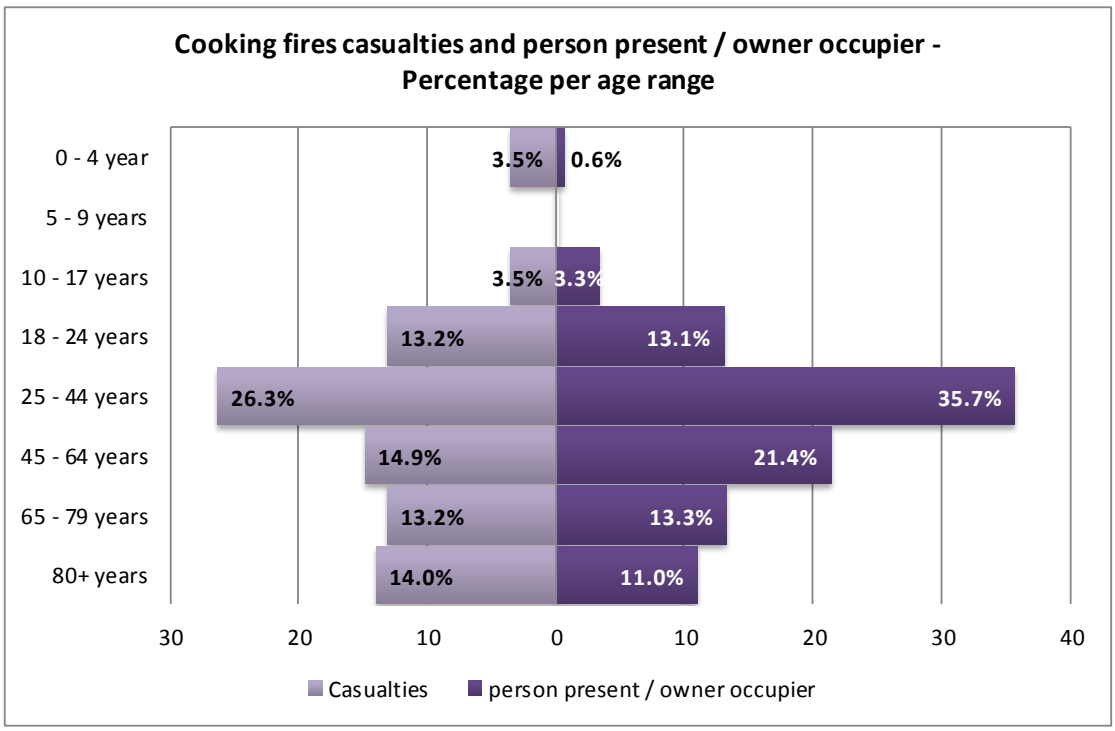


Chart 3. Cooking ADF in Coventry & Solihull: casualties and person present/owner occupier - % per age range

Compared to the 2011 Census[2], where they represent 4% of the Coventry & Solihull population, people of **black Afro-Caribbean ethnicities** were over-represented both as the owner occupier or person present during cooking-related accidental dwelling fires (11.6%) and as a casualty of those incidents (11.4%). People of **white ethnicity** were also over-represented as casualties in cooking fires: 84.2% compared to 79.9% of the population.

In 30.3% of cooking incidents (146) **distraction** was recorded as human factor. Distraction was particularly high where the owner occupier / person present during was aged 65 or over, suggesting an age-related issue.

Analysis also showed that the proportion of **single person households** was slightly higher for cooking fires (41.5%, 200 incidents) than accidental dwelling fires overall (34.7%, 329 incidents). In those types of fires the owner occupier or person present tended to be **aged 45 to 64**.

Overall, **rented properties** accounted for the greatest proportion of accommodation type where a cooking ADF occurred (65.6%), although they represented just under a third of household tenure in Coventry & Solihull[3]. They were more likely to be lone-person households, be of black Afro-Caribbean or white ethnicities, and aged 25-44. Properties rented from **housing associations** represented almost a quarter all rented accommodation where a cooking fire occurred.

Cooking fires tended to be **caused by adults** aged 18-64 (65.2% of incidents) and the **elderly** (22.4%); the proportion of fires caused by the elderly was higher in Solihull than Coventry, and there were also comparatively more incidents caused by youths aged 10-17 in Solihull (7.3%, 10 incidents) than Coventry (3.2%, 11 incidents).

The Mosaic types in figure 1 incurred the greatest number of ADF.

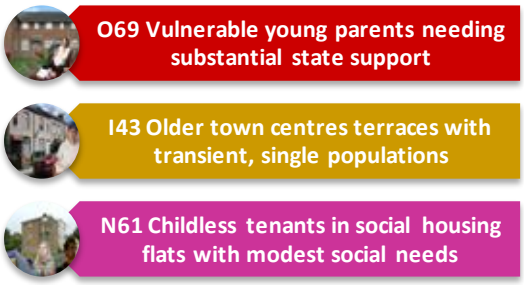


Figure 1. Top 3 Mosaic types for number of cooking ADF, in descending order

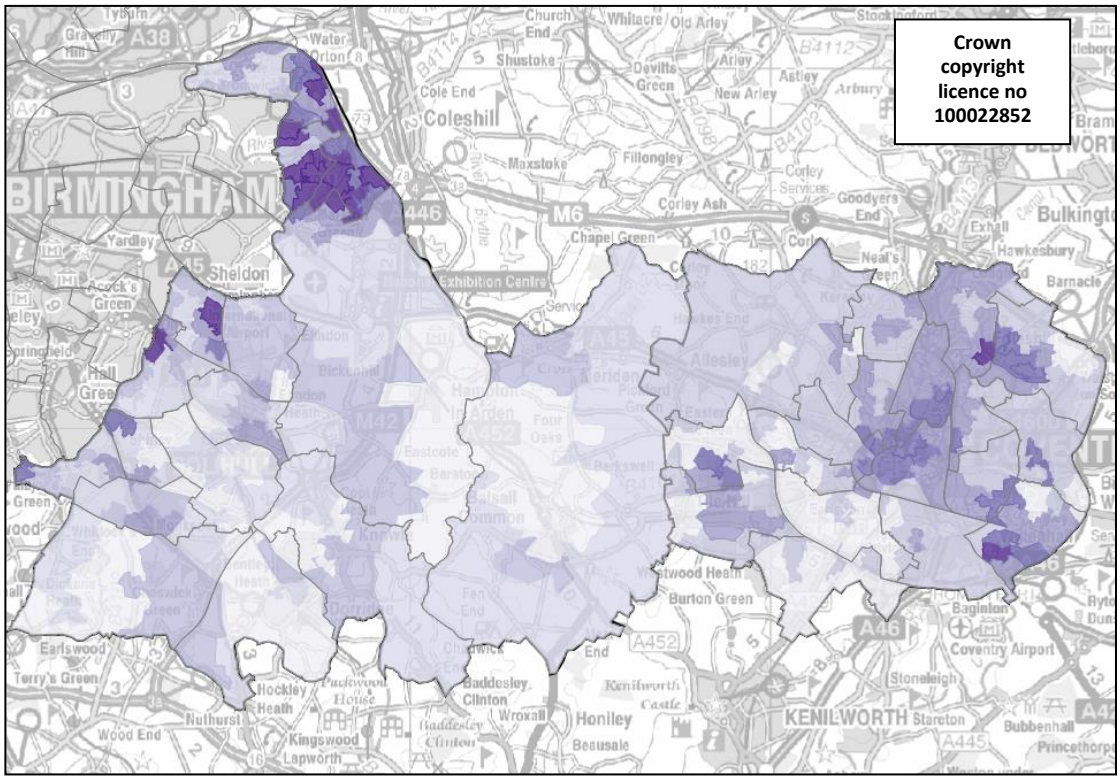
Figure 2. Mosaic types showing positive correlation with cooking ADF, in descending order of correlation coefficient

However correlation analysis shows that N66 and N60 had a strong correlation to ADF while N61's was moderate. E21 Mosaic type had a moderate negative correlation, suggesting they are less at risk

[2] Census 2011 table: Ethnic Group (KS201EW)
[3] Census 2011 table: Tenure – Households (QS405EW)

Cooking fires accounted for most of the accidental dwelling fires casualties; however the severity of the injuries was generally more minor and they were more likely to be given first aid at the scene.

As cooking fires make up such a large proportion of ADF, the geographical distribution of the risk of cooking fires is very similar to that of ADF overall:



Map 2. Cooking Accidental Dwelling Fire calculated risk score in Coventry & Solihull

The box below summarises the main features of cooking accidental dwelling fires in Coventry & Solihull:

COOKING FIRES:

- March to June, December
- 16:00 to 20:00, and 12:00 to 19:00 on Sundays
- 12.9% alcohol- or drug-related, especially in Solihull
- more casualties aged 25 to 44, although 80+ more vulnerable
- Afro-Caribbean ethnicities: person present during fire and casualties
- White ethnicities: casualties
- Distraction, especially for those aged 65+
- Single person households, especially aged 45-64
- Rented properties, particularly from housing associations
- Caused by adults and the elderly
- Mosaic types O69, I43 and N61

Electricity supply

Between April 2011 and March 2014, accidental dwelling fires caused by electricity supply accounted for 12.4% of all accidental dwelling fires, and resulted in one fatality and 12 injuries (6.3% of all casualties, but 12.5% of PI injuries and fatalities).

The seasonality chart below shows that electricity supply accidental dwelling fires are most likely in the **winter months,** which is consistent with more electricity being used for lighting or heating, as daylight diminishes and the weather becomes colder.

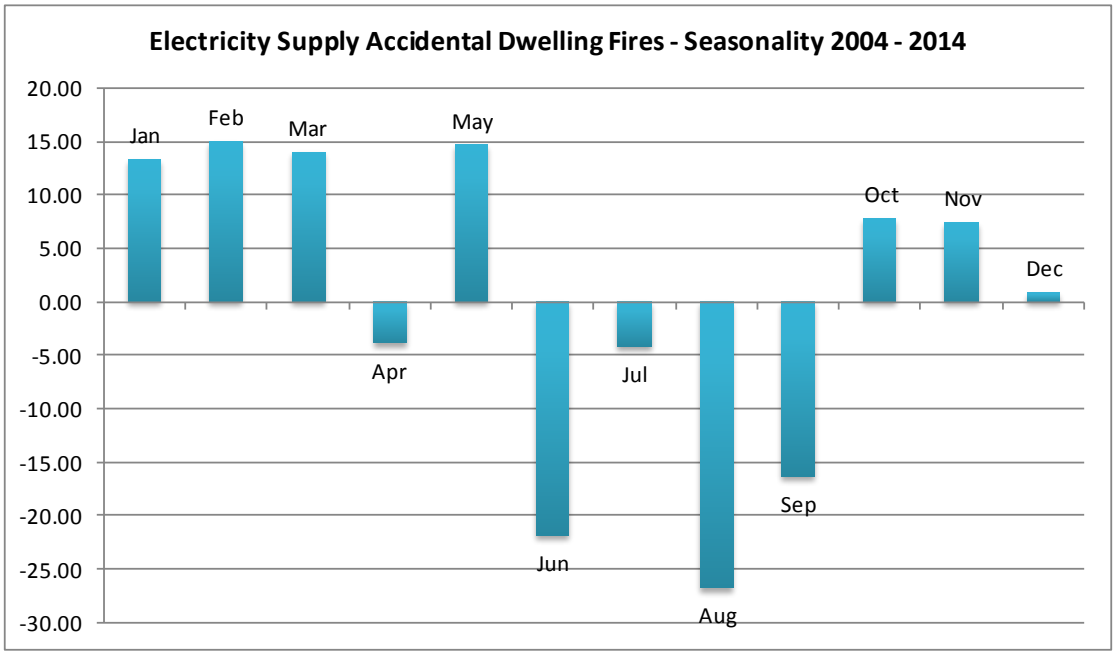


Chart 4. Seasonality - Electricity Supply Accidental Dwelling Fires in Coventry & Solihull

Table 3 shows that electrical fires tend to be highest in the **late afternoon** and in the **evening**. **Sunday** had the highest number of incidents:

Table 3. Electricity supply Acc Dwell Fires in Coventry & Solihull per hour and day – Apr 2011 to Mar 2014

Day / Hour	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*
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Wiring, cabling and plugs were responsible for 91.5% of electricity supply fires. Current recording practices do not allow for analysis of the type of appliances the wiring, cable and plugs were connected to, although wiring insulation was recorded as the item mainly responsible in over half of incidents.

Those incidents are highest in **owner occupied properties**, with almost half (48.7%) of electricity supply incidents at this type of accommodation. However, when comparing with Census information, **rented** households are over-represented, accounting for 32.5% of the area's households but 47.9% of electricity supply accidental dwelling fires.

46.2% of the owner occupiers or persons present during the fire were within the **25-44 years old** age range, which is more than accidental dwelling fires in general (37.4%).

In the Command Area overall, electricity supply accidental dwelling fires were most likely to start **under stairs** (18.8%) or in a **corridor / hall** (14.5%), although in Solihull they were more likely to start in the **kitchen** or **garage**.

Casualties resulting from electricity supplies fires were more likely to be seriously injured, with 30.8% going to hospital for treatment, compared to 15.5% for overall ADF.

Correlation analysis did not result in strong enough correlations to enable a calculated risk score and an illustrative map, but the box below summarises the main features of electricity supply accidental dwelling fires in Coventry & Solihull:

ELECTRICITY SUPPLY FIRES:

- Winter months
- Late afternoon and evening
- Wiring, cabling and plugs
- Owner occupied higher, but rented is over-represented
- Under stairs and in corridor/hall for Coventry
- Kitchen or garage for Solihull
- Owner occupiers/person present aged 25-44

Other domestic style appliances

Between April 2011 and March 2014, accidental dwelling fires caused by electricity supply accounted for 11% of accidental dwelling fires in Coventry & Solihull. They resulted in 13.5% of casualties: one fatality and 27 injuries; this is the second highest number of casualties after cooking fires.

This ignition source category includes appliances such as white goods, gardening equipment, hairdryers, computers or kettles.

Chart 5 is the seasonality chart for smoking related dwelling fires in Coventry & Solihull. It shows that these types of incidents are more likely in **spring and early summer**, as well as in **December**.

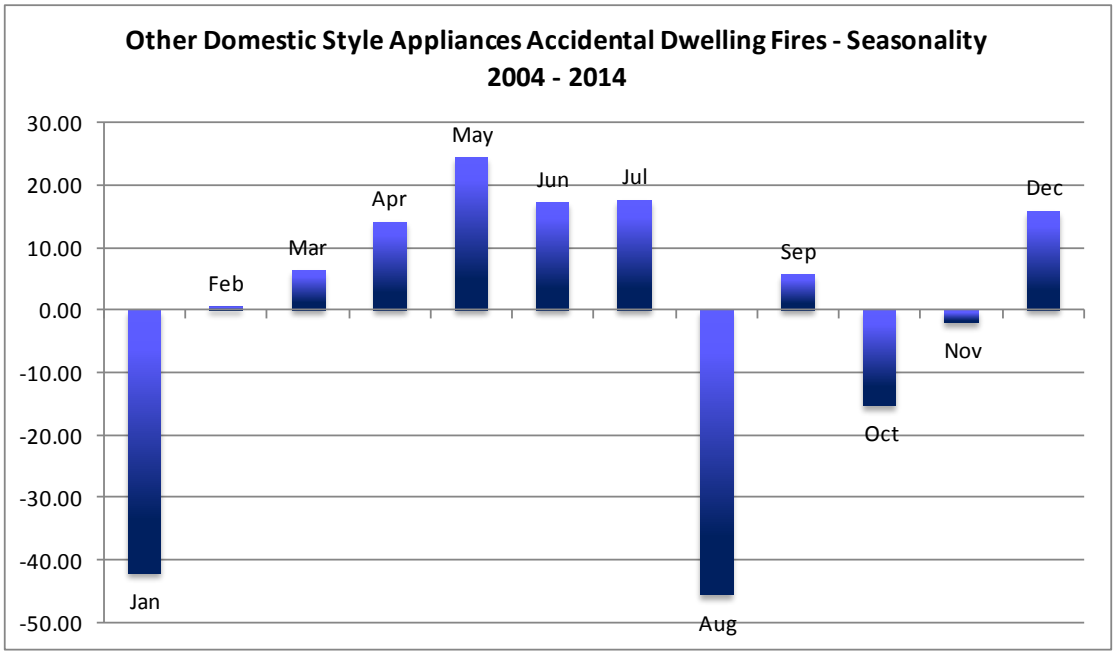

Chart 5. Seasonality - Other domestic style appliance Accidental Dwelling Fires in Coventry & Solihull

Temporal analysis shows that accidental dwelling fires due to other domestic style appliances tend to take place **between 17:00 and 23:00**, which is likely due to people being at home and using domestic appliances. There were also two further peaks: from 09:00 to 10:00 and from 12:00 to 13:00.

The appliances most responsible for the fires were **washing machines** and **tumble dryers**, with 23 incidents (22.1%) and 21 incidents (20.2%) respectively. However, incidents involving **fridge / freezers** resulted in more injuries (11 of the 27).

Properties where other domestic style appliances fires took place tended to be **owner occupied** (53.9% of incidents), although rented accommodation was slightly over-represented (44.2% of incidents compared to 32.5% of households), especially **from a housing association** (15.4% of incidents compared to 8.2% of households).

Correlation analysis did not result in strong enough correlations to enable a calculated risk score and an illustrative map, but the box below summarises the main features of other domestic style appliance accidental dwelling fires in Coventry & Solihull:

OTHER DOMESTIC STYLE APPLIANCES FIRES:

- Spring and early summer, December
- 17:00 to 23:00
- Washing machine and tumble dryers
- Fridge/freezers result in more casualties
- Owner occupied and rented from housing association

Smoking related (including cigarette lighter)

Between April 2011 and March 2014 smoking related accidental dwelling fires accounted for 10.1% of all accidental dwelling fires, and resulted in 24 casualties – including four of the nine fatalities.

The seasonality chart below shows that smoking related accidental dwelling fires are most likely in March, June, August and December:

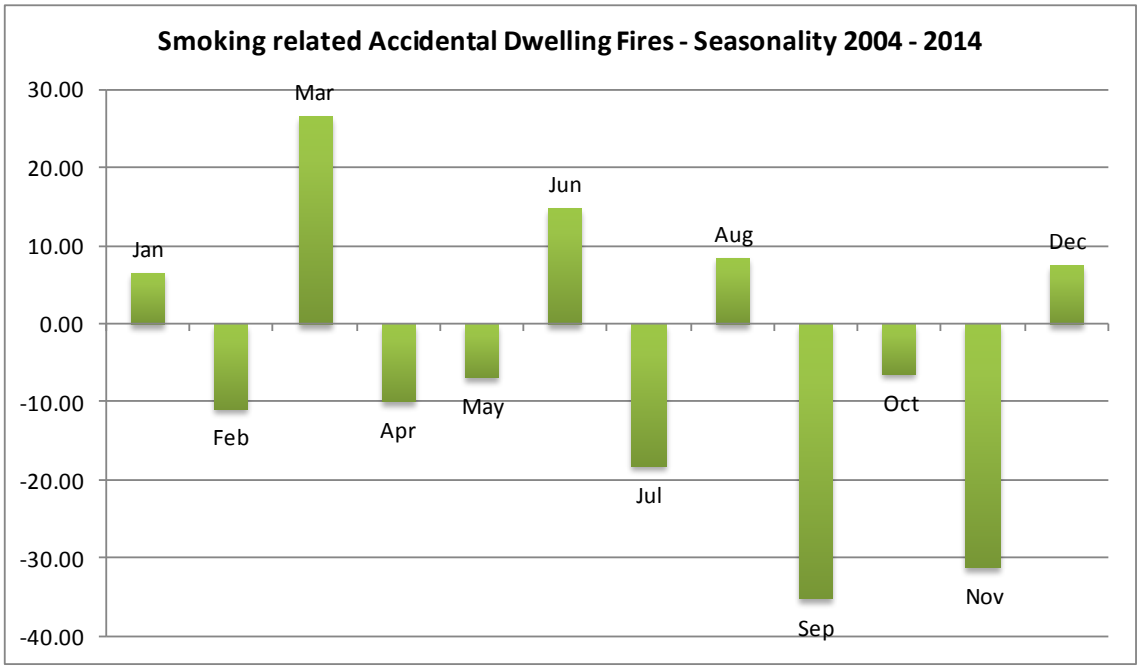

Chart 6. Seasonality - Smoking related Accidental Dwelling Fires in Coventry & Solihull

Temporal analysis showed that smoking related incidents tend to take place in the evening: 41.7% occurred between 17:00 and 00:00, particularly on Saturday:

Table 4. Smoking related Acc Dwell Fires in Coventry & Solihull per hour and day – Apr 2011 to Mar 2014

Day / Hour	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*	*23*
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Smoking related fires had one of the highest proportions of alcohol / drug related incidents, with 15.6% recorded as believed to be linked to alcohol or drug consumption, compared to 9.2% for overall ADF. Just over a quarter of those incidents resulted in a casualty going to hospital.

This proportion of alcohol or drug related smoking ADF was much higher in Coventry (20.3%) than in Solihull (6.3%).

The highest contributory human factor for Coventry incidents was **falling asleep**, while for Solihull incidents it was **mental health**. This is likely to be related to the age of the person present or owner occupier: where an actual age was recorded, the average in Coventry was 46 years, while in Solihull it was 61.

Smoking related ADF also had one of the highest proportion of properties recorded as **single person households**, which accounted for 45.8% of incidents (44 incidents), although Census figures indicate single person households only represent 30.4% of total households[4]. Almost half of these were **aged 65 or over**.

Overall, the greatest proportion of smoking related fires started in the **living room** (24%, 23 incidents), although in Coventry they were more likely to start in the **bedroom** (23.4%, 15 incidents).
Bedroom smoking fires also resulted in the greatest number of casualties (10 of the 24), the second highest average total area damage and the third highest average burn damage.

Adults **between the ages of 25 and 44** were the most likely **person present during the fire/owner occupier** for smoking related ADF, but those in the **65 to 79** age range were more likely to be **casualties**:

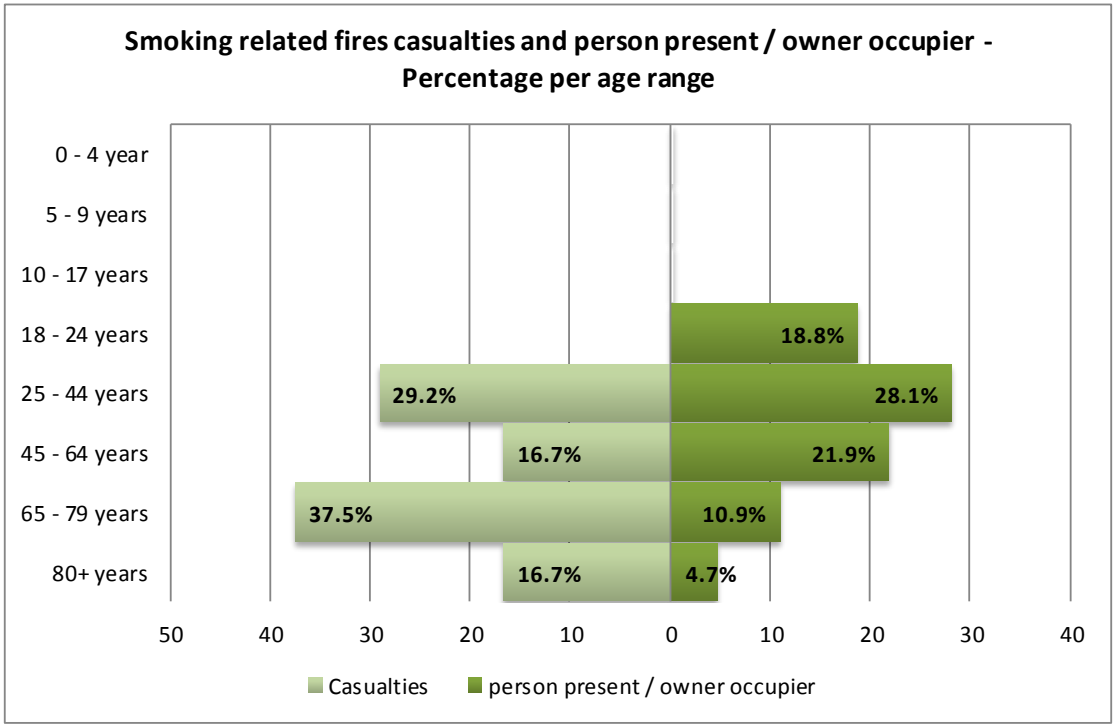


Chart 7. Smoking related ADF casualties and person present/owner occupier - % per age range

However, when considering the boroughs separately, **Coventry's casualties** were more likely to be aged **between 25 and 44**.
Adults (18-64) were most likely to cause smoking related fires.

[4] Census 2011 table: Household Composition – Households (QS113EW)

Smoking related ADF had the highest proportion of incidents at **rented** properties, with 72.9% (70), with properties rented **from the council and housing associations** together incurring over half of all smoking related incidents (28.1% and 26% respectively).

Smoking related accidental dwelling fires at rented accommodation in Solihull tended to take place at those rented from the Council, while in Coventry they were more likely to be rented from housing associations. This is consistent with Census data, which indicates that properties rented from the council are higher in Solihull (11.9% of total households), whereas properties rented from a housing association are higher in Coventry (11.6%).

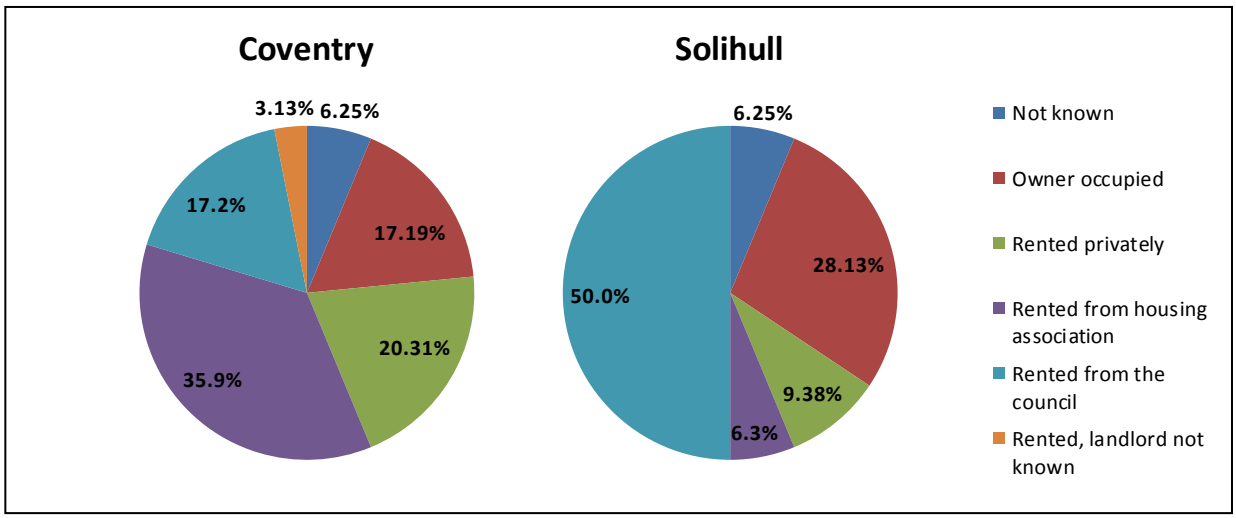


Chart 8. Smoking related ADF in Coventry & Solihull - Tenure %

21.9% of smoking related fires occurred at high rises (4 floors and over), compared to 13.5% for overall ADF.

7.3% of smoking accidental dwelling fires occurred at properties where there had previously been a fire which was reported to the fire brigade. This was the highest proportion compared to other sources of ignition.

The Mosaic types in Figure 3 incurred the highest numbers of smoking related accidental dwelling fires.

Figure 3. Top 3 Mosaic types for number of smoking related ADF, in descending order

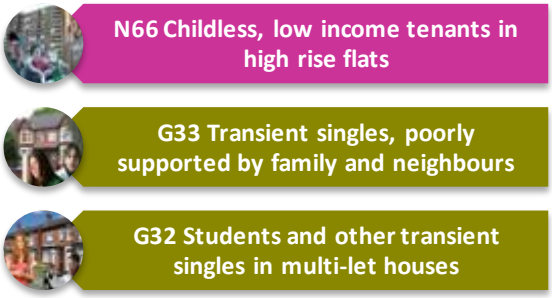
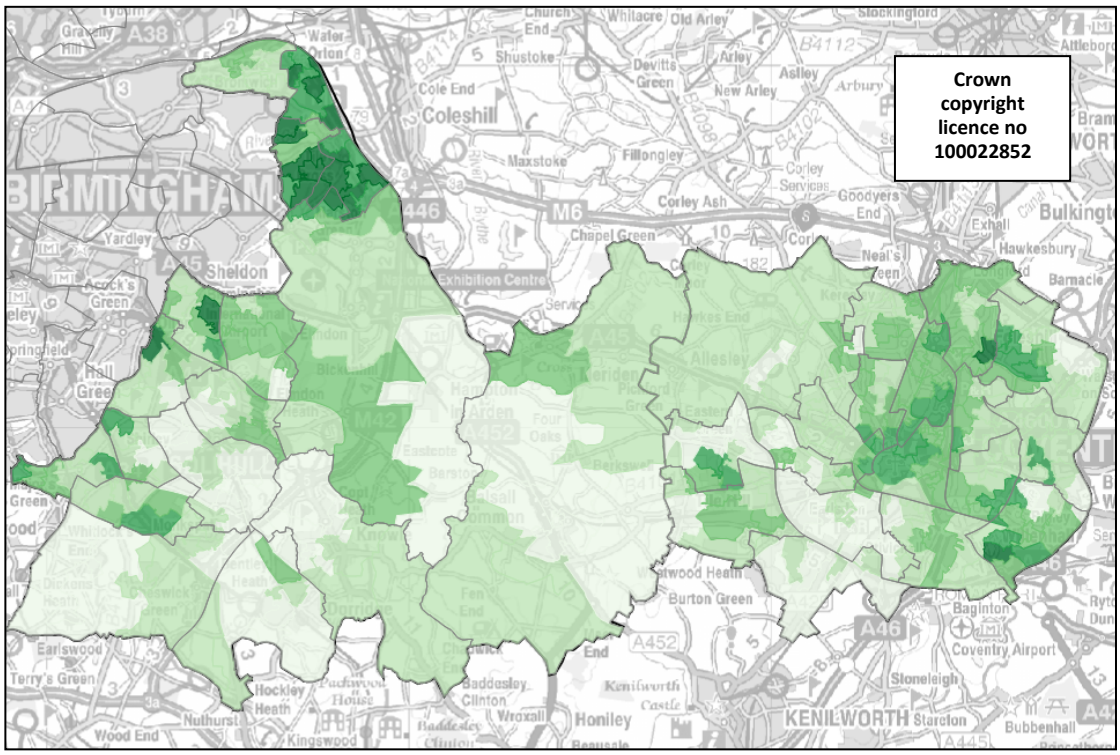


Figure 4. Mosaic types showing a correlation with smoking related ADF, in descending order of correlation coefficient

However correlation analysis shows that N66 has a strong correlation to ADF while G33 and G32 have a moderate correlation (Figure 4).

Map 4 shows the geographical distribution of the risk of smoking related fires. The darker the area, the higher the risk of smoking related accidental dwelling fire:



Map 3. Smoking related Acc Dwell Fire calculated risk score in Coventry & Solihull

The box below summarises the main features of smoking related accidental dwelling fires in Coventry & Solihull:

SMOKING RELATED FIRES:

- March, June, August, December
- Between 17:00 and 00:00, particularly Saturday
- 15.6% alcohol or drug related
- Falling asleep in Coventry, mental health in Solihull
- Single person households, particularly aged 65+
- Living room in Solihull, bedroom in Coventry
- Person present/owner occupier: aged 25 - 44
- Casualties: overall aged 65+, although Coventry: 25 - 44
- Rented properties: council (Solihull) and housing associations (Coventry)
- Caused by Adults (18-64)
- Mosaic types M59, N66 and N60

Place the fire started

Kitchen fires accounted for 60.9% of all ADF in Coventry & Solihull, which is consistent with cooking appliance being the greatest source of ignition.

Kitchen fires resulted in the greatest number of casualties (138), but five of the nine fatalities resulted from **living room** fires, which were the second largest place where ADF started (7.6%). Almost a third of accidental dwelling fires that started in the living room were smoking related.

While there was a smaller overall proportion of **bedroom** fires (6.2%), these have increased over the last three financial years, and they resulted in the second highest number of casualties with 21 (10.1% of all casualties). Fires starting in the bedroom also resulted in higher average burn damage area and higher average total damage area than living room or kitchen fires.

Property tenure

58.2% of accidental dwelling fires in Coventry & Solihull occurred in **rented properties**, while representing just 32.5% of households according to Census data[5].

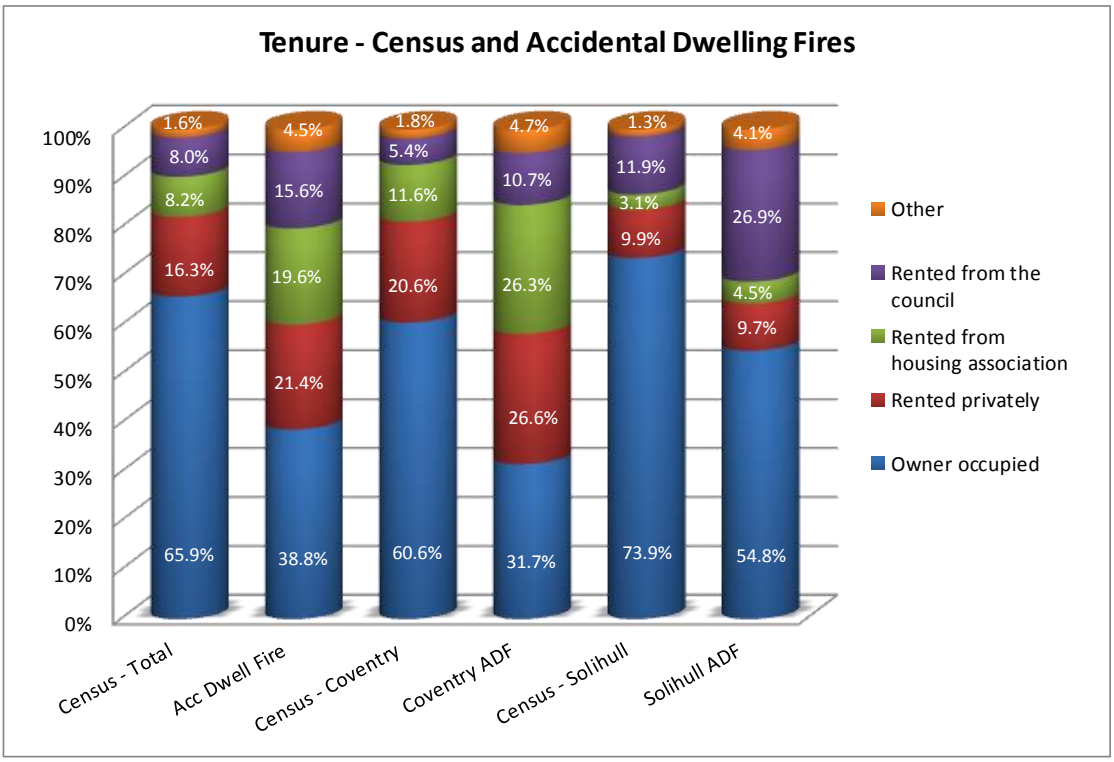


Chart 9. Tenure in Coventry & Solihull: Census and Accidental Dwelling Fires

[5] Tenure Census data includes a "living rent free" and a "shared ownership" category which are not found in ADF data but are included here under the heading "Other". Likewise, Tenure Census data does not contain categories for unknown tenure type or "rented, landlord not known", and so those were included in "Other"

The graph above shows that properties **rented from the council** and those **rented from housing associations** are particularly over-represented in accidental dwelling fires.
This is even more noticeable when focusing on each borough separately: in Solihull properties rented from the council incur 26.9% of accidental dwelling fires despite representing 11.9% of households, and in Coventry 26.3% of incidents took place at properties rented from a housing association while they only represented 11.6% of households.

18% of all accidental dwelling fires (170 incidents) occurred at **socially rented** properties occupied by a **single person.** Over a third of those were occupied by someone aged 65 or over.

Damage

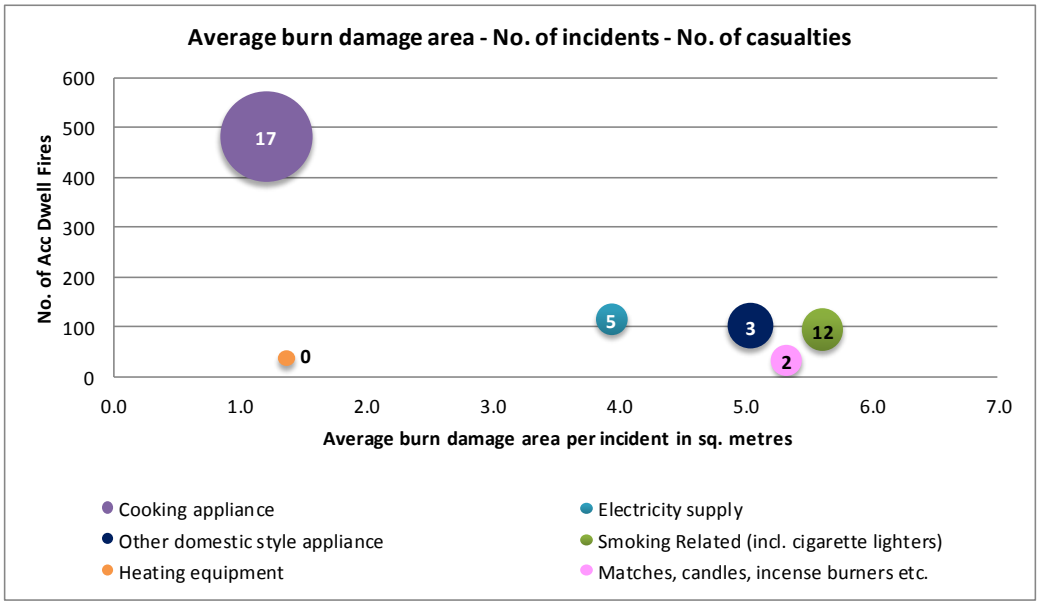
Burn damage
Where burn damage was recorded, the average damaged area for Coventry & Solihull accidental dwelling fires was 3.3 sq m.
Solihull's average burn damage was higher than Coventry: 4.3 sq m compared to 2.8 sq m; this may partly be due to the longer delay between the time the call comes in and the **attendance time** in Solihull. Solihull incurred five of the seven incidents where burn damage covered an area between 51 and 100 sq m.

Chimney fires, fires resulting from natural occurrences, and naked flames fires had the greatest average burn damage; however they represented a very small proportion of incidents: seven naked flames fires, two chimney fires and one resulting from a natural occurrence (lightning strike) over the time period analysed.

Aside from the above, **smoking related** fires had the highest average area of burn damage, with 5.6 sq m, while cooking fires were the most likely to result in no fire damage and had the lowest average burn damage with 1.2 sq m.

The graph below compares the average area of burn damage, the number of incidents and the number of casualties for the six sources of ignition which resulted in the greatest number of incidents.

The size of the bubbles varies according to the total number of casualties resulting from this source of ignition; the number within it is that of PI casualties (injuries and fatalities).



It shows that although cooking fires are more numerous and incur more casualties, the resulting area damaged by fire is relatively small compared to other sources of ignition.
Smoking related fires are lower in overall volume, but much higher in average burn damage, and resulted in almost as high a number of PI casualties as cooking fire.

Unsurprisingly, burn damage was also on average greater where no alarm system was installed and, if one was installed, where it did not operate or did not raise the alarm.

Detached houses tended to suffer greater burn damage, which is likely due to being larger than other types of properties.
Average burn damage in high-rises (four floors or more) was slightly higher than in other types of properties (3.9 sq m compared to 3.2 sq m); however burn damage area size did not change relatively to the floor the fire originated from.

Owner occupied properties tended to incur greater burn damage than other property types. This is likely linked to owner occupied properties where an accidental dwelling fire took place being less likely to have an alarm system, or an operating alarm system where there was one.

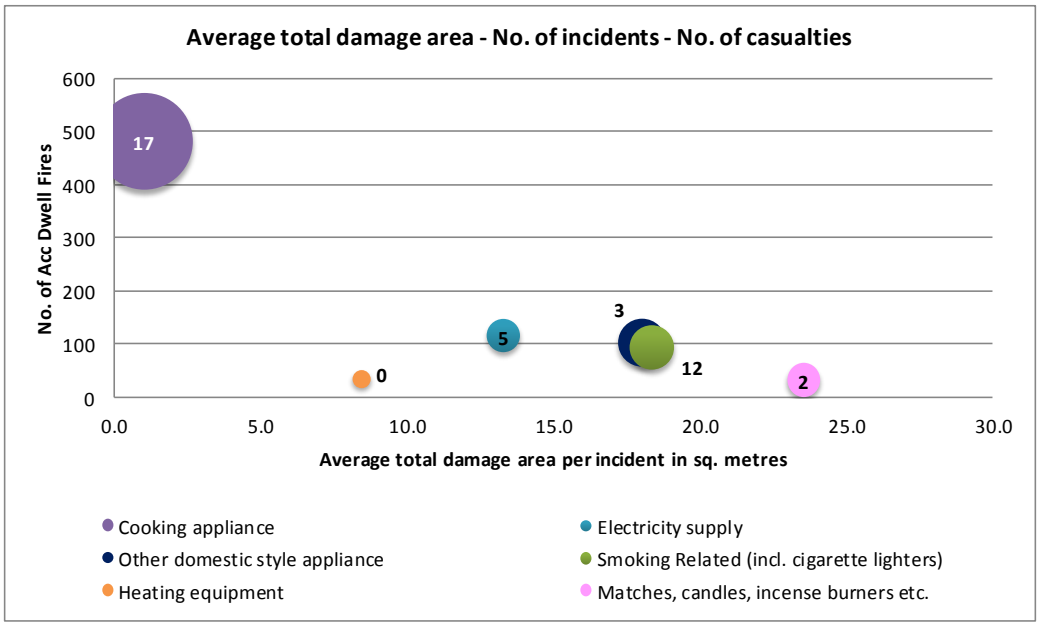
Alcohol or drug related incidents resulted in greater burn damage. This could be due to a slower reaction from the person impaired by intoxicants, resulting in a longer delay in alerting the Fire Brigade.

Total damage
Average total damage for ADF in the Command Area was 11.4 sq m. Like burn damage it was slightly higher for Solihull: 13 sq m compared to 10.7 in Coventry.

Natural occurrence, chimney and naked flame fires again had the largest area damaged.
Of the top four sources of ignition in Coventry & Solihull, **smoking related** fires and those caused by **other domestic style appliances** resulted in the largest damaged area, with an average of 18.4 sq m and 18 sq m respectively.

Like burn damage, owner occupied properties incurred greater total damage than other property types, as did properties where no or non-operating alarm systems were installed.

The graph below compares the average area of total damage, the number of incidents and the number of casualties for the six sources of ignition which resulted in the greatest number of incidents.
The size of the bubbles denotes the total number of casualties resulting from this source of ignition; the number is that of PI casualties (injuries and fatalities).



Like burn damage, it suggests that cooking fires resulted in minimal damage, while for instance smoking related fires resulted in 12 PI casualties and one of the highest average damaged area, despite the smaller number of incidents.

Like burn damage, alcohol or drug related incidents tended to result in greater overall damage, as did properties that were owner occupied.

Demographics

Person present during the fire/owner occupier

There were slightly more female owner occupiers / persons present during the fire with 49.9% compared to 43.5% that were male.
34.7% lived in single person households. Men were more likely to be living in a single person household than women.

In general, the person present at the fire / owner occupier was more likely to be **aged between 25 and 44**, although in Solihull they tended to be older:

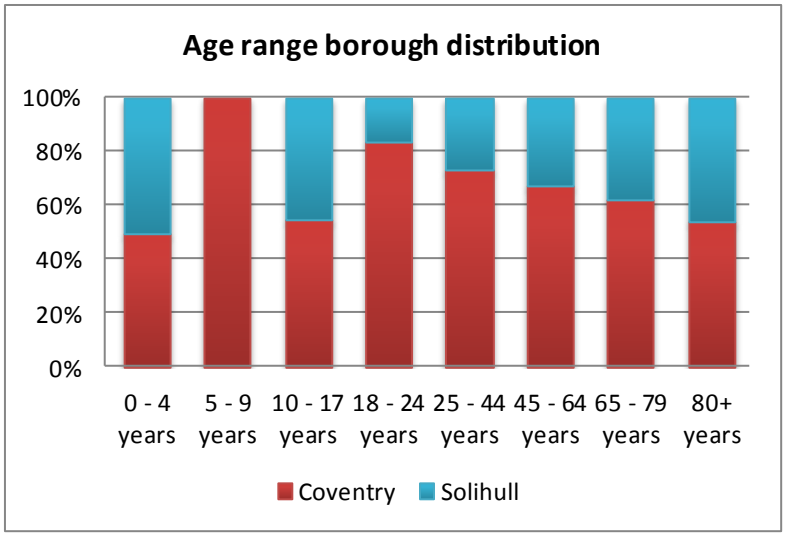
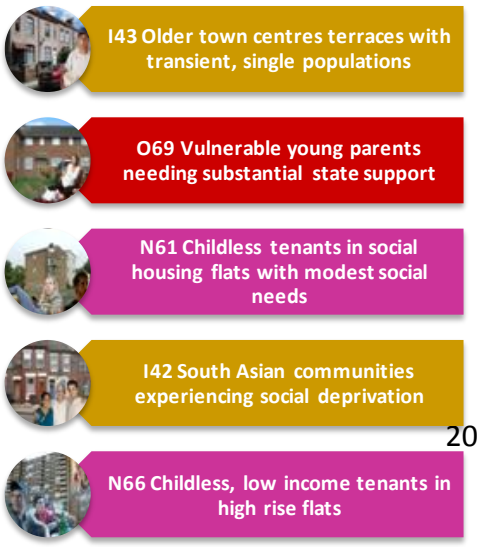


Chart 10. Borough distribution for person present at fire / owner occupier age range

Although only 2.1% of incidents (20) took place at properties where there had previously been a fire, it should be noted that 60% of those (12) took place in Solihull borough.
17 of those 20 properties were single person households, and in nine of those the resident was aged 65 or more.
17 of those 20 properties involved a contributory human factor: including seven which were linked to mental health issues and five to falling/being asleep.

Mosaic
The Mosaic types of households most affected by accidental dwelling fires are



shown below on the left (Figure 5), households classified as I43 having had the most.

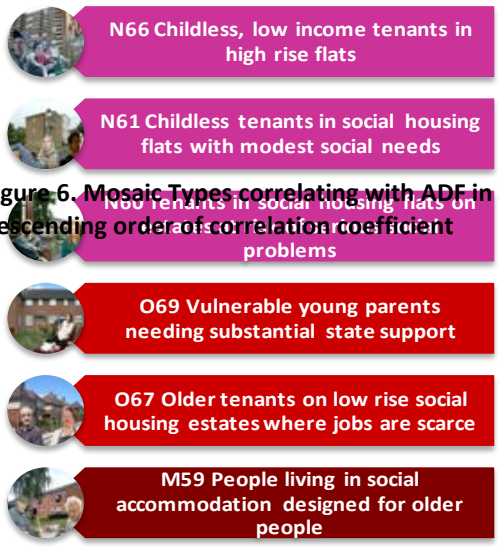


Figure 6. Mosaic Types correlating with ADF in descending order of correlation coefficient

However, they differ slightly from those which show a strong or moderate correlation to the number of accidental dwelling fires per LSOA, on the right (figure 6).

Figure 5. Top 5 Mosaic Types in descending order of number of ADF incurred

Analysis shows that, apart from O67, the Mosaic types which correlate with ADF are also those which are most over-represented when compared to the proportion of the population they make up.

I43 is also over-represented in ADF incidents, and does show a strong correlation to ADF in Solihull only.

Cause of the fire

Overall, adults (18 – 64) were the greatest cause of the fire; they were responsible for 46.6% of accidental dwelling fires in Coventry & Solihull.

Proportionally, accidental dwelling fires caused by the elderly tended to result in a greater number of casualties: 14.9% of ADF were caused by the elderly, but they resulted in 29% of the casualties. Most of those casualties were also elderly, and were the resident/occupier of the property.

The most common human factor recorded as believed to have been contributory to the cause, spread or resulting injuries from the fire was distraction, with 17.5% of accidental dwelling fires in Coventry & Solihull.

9.2% of accidental dwelling fires were recorded as linked to drug or alcohol consumption. Over half of those were also recorded with 'falling asleep' as a contributing factor, and 72.4% took place at a single person household.

Casualties

Cooking fires resulted in the greatest number of casualties, with 113 injuries and one fatality (55.1% of total).

Half of the smoking related fire casualties were PI injuries or fatalities, the greatest proportion compared to other sources of ignition.

Where an age was recorded, casualties were most likely to be aged 25 to 44 (56 casualties), although the 65 to 79 years and 80+ age ranges together accounted for 34.5% of casualties (67).

Eight of the nine fatalities were aged over 65, including five aged 80 or over. 10 of the 31 PI injuries were also aged 65 or over. Seven of the eight fatalities aged 65+ and six of the 10 PI injuries aged 65+ also lived in **single person households**.
This suggests that older people are more likely to suffer injuries, and for those to be serious injuries, especially when living on their own.

Solihull tended to incur more casualties compared to the proportion of ADF. For instance 66.7% of electricity supply fires took place in Coventry, but only 46.2% of the resulting casualties were also in Coventry. This is likely linked to the population of Solihull being older than that of Coventry[6], as the over-65 represented a high proportion of the casualties.
Fires resulting from non-cooking domestic appliances were an exception though, with Coventry incurring 72.1% of incidents and 85.7% of the resulting casualties.

Predictably, casualties were more likely to suffer serious injuries when no alarm system was installed or when it did not operate.

There were more female than male casualties, although men were slightly more likely to go to hospital and therefore to be a PI injury. This is probably linked to male casualties being more likely than female casualties to be injured while under the influence of drugs or alcohol, while fighting fire, or while returning to the fire.

Although the majority of casualties were of **white ethnicities** (85%), residents of **black Afro-Caribbean ethnicities** were over-represented compared to Census data, making up 8.2% of all casualties, compared to 4% of the population.

Alcohol or drug was a factor in 9.2% of accidental dwelling fires, yet resulted in 24.2% of casualties. In particular, 35.5% of PI injuries (PI2) resulted from fires where alcohol or drug was a factor.
Three quarters of ADF involving drugs or alcohol were recorded with a contributory human factor; specifically, half also involved the resident falling/being asleep. 15.9% of all injuries (33) resulted from fires involving both alcohol/drug consumption and falling or being asleep.

The box below summarises the main features of casualties and rescues of accidental dwelling fires in Coventry & Solihull:

CASUALTIES:

- Cooking fires for volume, smoking fires for severity
- 25 to 44 years old and over 65
- Over 65s more serious injuries, especially single-person households
- More female than male, but male sustain more serious injuries
- Male more likely injured linked to drug/alcohol, fighting fire or returning to fire
- White ethnicities for volume, but black Afro-Caribbean over-represented
- Alcohol or dug consumption related

[6] Census 2

APPENDIX A – Correlation analysis: variables used

The variables included in correlation analysis were as follows (all were broken down into LSOAs):
The number Accidental Dwelling Fires (April 2011 to March 2014)
The number of households (Census 2011)
The number of residents (Census 2011)
The population density per hectares (Census 2011)
Income Deprivation Index
Employment Deprivation Index

Health Deprivation Index
The number of children aged 0 to 16 (Census 2011)
The number of elderly residents (aged 65 and over) (Census 2011)
The number of single parent households (Census 2011)
The number of households socially renting (Census 2011)
The number of households where no adult were in employment (Census 2011)
The number of households with at least one person with long-term health problem or disability (Census 2011)
The number of single-person households where the resident is aged 65 or over (Census 2011)
The number of residents of all black and Afro-Caribbean ethnicities (Census 2011)
The number of residents of all mixed ethnicities (Census 2011)
The number of residents of all Asian ethnicities (Census 2011)
The number of residents of all white ethnicities (Census 2011)
The number of addresses for each of the 69 Mosaic types

Not all of the above were included in the overall Accidental Dwelling Fires calculated risk score, only those which analysis showed to have a moderate or strong correlation (whether positive or negative) were.

The table below shows the accidental dwelling fire correlation coefficient for variables with a moderate to strong correlation. A coefficient between 0.30 and 0.39 is a moderate positive relationship, 0.40 to 0.69 is a strong positive relationship (shown in **bold** in the table). The only negative relationship was a moderate one (between -0.30 and -0.39) with the number of residents aged 65 or over.

Variable	Correlation Coefficient
Socially rented households	**0.615979**
Employment deprivation index	**0.579527**
health deprivation	**0.575857**
Income deprivation index	**0.569351**
Households where no adults are in employment	**0.544862**
Total number of residents of Afro-Caribbean ethnicity	**0.532269**
Total number of residents of mixed ethnicity	**0.509720**
Mosaic type: N66 Childless, low income tenants in high rise flats	**0.490672**
Single parent households	**0.465641**
One person in household with long-term health problem or disability	**0.459407**
Mosaic type: N61 Childless tenants in social housing flats with modest social needs	**0.437550**
Mosaic type: N60 Young tenants in social housing flats on estates at risk of serious social problems	0.391624
Mosaic type: O69 Vulnerable young parents needing substantial state support	0.369979
Number of households	0.369712
Mosaic type: O67 Older tenants on low rise social housing estates where jobs are scarce	0.364109

Please note, the 'household where no adults are in employment' variable differs from Employment Deprivation in that it refers to the count of households where all residing adults were unemployed at the time of the Census, while the Employment Deprivation index measures employment deprivation in an area conceptualised as involuntary exclusion of the working age population from the labour market.

Cooking fires showed no correlation to the number of residents, population density, the number of children under 16 or of elderly people, the number of single-person households where the resident is aged 65 or over, and the number of residents of white, Asian, or 'other' ethnicities.

Smoking related fires only showed correlation to income, employment and health deprivation indices, the number of socially rented households, the number of households where no adult were in employment, and the number of residents of Afro-Caribbean ethnicities.

Both cooking and smoking related fires showed correlation to some Mosaic types, which are included in the scoring and mapping.

Electricity supply fires and fires linked to other domestic style appliances only showed weak correlations and therefore no calculated risk scores could be created.